ACTION MEMORANDUM

Non-Time Critical Removal Action
WARM SPRINGS TAILINGS

Helena National Forest
Helena Ranger District
Jefferson County, Montana

June 26, 2013

ACTION MEMORANDUM

Date: June 26, 2013

Subject: Request for Approval of a Non-Time-Critical Removal Action at the Warm Springs Tailings Site, Helena National Forest, Jefferson County, Montana

From: Bethany A. Ihle, On-Scene Coordinator

To: Faye L. Krueger, Regional Forester, Northern Region

Through: Heather DeGeest, Acting District Ranger, Helena Ranger District

William Avey, Forest Supervisor, Helena NF & Lewis and Clark NFs

Bob Kirkpatrick, Region 1 CERCLA Coordinator

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed Non-Time-Critical Removal Action at the Warm Springs Tailings project site in Jefferson County, Montana as authorized by Section 104 of the Comprehensive, Environmental, Response, Compensation, and Liability Act (42 U.S.C. § 9604) (*Attachment 1*). The removal action will include construction of a repository to be located near the Site on National Forest System Lands (NFS lands), and removal of approximately 35,000 bank cubic yards of mine waste material from four tailings impoundments located adjacent to and in the Middle Fork of Warm Springs Creek.

Ongoing releases of hazardous substances from the Warm Springs tailings into Warm Springs Creek continues to cause exceedences of water quality standards for both aquatic life and drinking water. These releases are occurring on or from lands under the jurisdiction, custody, or control of the USDA Forest Service, Helena National Forest (NFS lands). Conditions at the Site may present an imminent and substantial endangerment to human health and the environment due to leachable concentrations of arsenic, lead and zinc found in the tailings impoundments. These conditions meet the criteria for conducting a Non-Time Critical Removal Action under 40 CFR Section 300.415 (b)(2) of the National Contingency Plan (NCP).

II. SITE CONDITION AND BACKGROUND

A. Site Description

Middle Fork Warm Springs Creek drainage hosts numerous prospect clusters and several abandoned-inactive mines categorized by the Montana Bureau of Mines and Geology as past copper, gold, lead and silver ore producers (Metesh et al., 1998). Historic lode mines of note within the drainage include the B&G, Newburgh and White Pine. These operations exploited east-west trending quartz veins containing pyrite, galena, chalcopyrite and aresenopyrite, common to Boulder Batholith related deposits. The Warm Springs Tailings were produced by a historic flotation mill operated by the Newburgh Mining and Milling Co. from 1934 to 1938;

processing high-sulfide ore and waste dump material from both the White Pine and Newburgh mines. Fine-grained sand to silt-sized tailings were slurried to four in-line tailings impoundments located in the drainage bottom. Subsequent breach of the impoundments by the creek has left the tailings in a physically unconfined and erodible condition.

1. Removal Site Evaluation

The tailings occur in the Middle Fork of Warm Springs Creek downstream of the ore producing mines and the mill which produced the tailings. These mines, the Newburg, White Pine and the B&G East are located on private patented lands upstream of the tailings. There has been no reclamation at these sites. The mines include a cluster of mostly collapsed and inaccessible workings including one open and five caved adits, one open and one caved shaft, and several waste rock dumps totalling approximately 17,000 cubic yards of waste. The disturbed area of these mines is estimated at 30 acres and includes roads and recent housing developments within the waste areas. Several of the adits are discharging and the water quality downstream of the mines is impaired due to the metals influence (Metesh et al, 1998; MDSL, 1995).

2. Physical Location

The Warm Springs Tailings removal site is located in the Middle Fork Warm Springs Creek drainage of the Elkhorn Mountains, approximately six miles southeast of Clancy, Montana. The legal description of the NFS lands subject to this removal action include: Section 30, Township 8 North, Range 2 West (Tailings Impoundments); and Section 24, Township 8 North, Range 3 West (Waste Repository), Montana Principal Meridian (*Attachment 1*).

The tailings impoundments lie solely on NFS lands administered by the Helena National Forest within Jefferson County, and cover a surface area of approximately eight acres. Neither the tailings impoundments nor the selected waste repository site is located immediately adjacent to private lands. Several patented land parcels exist at the head of Middle Fork Warm Springs Creek, updrainage of the tailings impoundments. Site and private land access is via Forest Road #4016, which is considered a Jefferson County road.

The Middle Fork Warm Springs Creek stream channel physically bisects the four tailings impoundments. The release or significant threat of release of a hazardous substances targeted by this Removal Action are from the highly erosive, unconfined mill tailings.

Observed public uses directly on the Site and surrounding area include dispersed camping, target shooting, firewood gathering, ATV use, and recreational prospecting. The area is also known to be frequented by hunters particularly during archery season.

3. Site Characteristics

The Warm Springs Tailings Site includes federal lands under the jurisdication, control and custody of the Forest Service, Helena National Forest, Helena Ranger District. The Site consists of four tailings impoundments that have been breached, and are now bisected by Middle Fork Warm Springs Creek. Breach of the impoundments resulted in deposition of tailings across the adjacent floodplain and downstream.

The impoundments are numbered TA 1 through 4 from downstream to upstream. Calculated volumes documented in the EE/CA are: 3,242 cubic yards in TA-1 and TA-2 total, 26,425 cubic yards in TA-3, and 4,572 cubic yards in TA-4 (MCS, 2002b).

There are several seeps and intermittent side drainages within the tailings area. The seep water quality shows metals exceedences and low flowing or intermittent drainages have eroded deep rills in the tailings suggesting periodic flows. Water quality samples of the tributary drainages do not show metals exceedences. The seep and side tributary data suggest that the metals contamination is a result of the metals in the tailings themselves or coming from mines upstream as opposed to contamination from mineralized bedrock in the vicinity of the tailings.

4. Release or Threatened Release into the Environment of a Hazardous Substance

a. Hazardous Substances

The hazardous substances as defined in Section 101 (14) of CERCLA, 42 U.S.C. § 9601(14) found at the Site include, but are not necessarily limited to arsenic, lead, and zinc.

Two preliminary site investigations have been conducted and published for the Middle Fork Warm Springs Creek mines and tailings area (MDSL, 1995; Metesh et al., 1998), and a detailed site investigation of the tailings removal area was conducted prior to the preparation of the Engineering Evaluation and Cost Analysis (MCS, 2002a; MCS, 2002b). Water quality and stream sediment data has also been collected and published for the greater Prickly Pear watershed by the U.S. Geological Survey that includes data relevant to this site (Klein et al., 2001).

In 1993, the Montana Department of State Lands (now the Montana Department of Environmental Quality) conducted an investigation of the mine waste dumps and adit discharges on the upstream private land of the site (MDSL, 1995). The MDSL effort was for the purpose of characterizing and ranking the hazards associated with abandoned and inactive hard rock mines for the State. This effort included collection of two stream sediment, four mine waste dump and two water quality samples on the private lands upstream of the tailings area. The results of the 1993 Montana Department of State Lands investigation identified that surface water flowing from the mines on private land exceeded the acute and chronic acquatic life criteria criteria for zinc and chronic acquatic life criteria for copper (MDSL, 1995, Site PA 22-046). Further site investigation and site characterization efforts were conducted by Olympus Environmental Science and Engineering, Inc. (1998), for the Montana Department of Environmental Quality Mine Waste Cleanup Bureau. Sample results verified and reinforced previous data which identified sources of impairment to surface water and groundwater in the Middle Fork of Warm Springs drainage (Olympus, 1998).

In 1998 the Montana Bureau of Mines and Geology conducted an investigation of the mine wastes and adit waters on private land as well as an investigation of the mill tailings area located on NFS lands for the purpose of characterizing the abandoned and inactive hard rock mine sites on NFS lands of the Helena National Forest (Metesh et al., 1998). This effort included collection of surface water samples upstream and downstream of the mines on private land, eight surface water samples in the tailings area on NFS lands, and eight samples of the tailings solids. The results of the 1998 Montana Bureau of Mines and Geology investigation identified that metals contaminated surface water exceeding drinking water and aquatic life standards is entering NFS lands upstream of the tailings, that the tailings have elevated metals, particularly arsenic (250-380 mg/kg), and that the surface waters within and downstream of the tailings area is receiving metals contaminants, particularly zinc which exceeds drinking water and acute aquatic standards, as it courses through the tailings area. In addition, seeps emanating from the tailings were sampled and have exceedences of drinking water and or aquatic life standards for aluminum,

arsenic, lead, and floride.

In 2000, the U.S. Geological Survey collected data for watershed level characterization of the mining related impacts to upper Prickly Pear Creek (Klein et al., 2001). This effort included collection of four water quality samples in the Middle Fork Warm Springs Creek, seven streambed sediment samples and four macroinvertebrate samples for metals. The results of this investigation mirrored the results of the previous site investigations for the water and stream sediment samples collected. Water quality samples identified that the Middle Fork Warm Springs Creek drainage contains some of the highest levels of arsenic of the greater upper Prickly Pear watershed. Arsenic levels upstream of the tailings area were 2.0-53 ug/liter in three samples and downstream of the tailings area were 42-87 ug/liter for total recoverable metals. Streambed sediments contain highly elevated aresenic (11-3,000 mg/kg) and zinc (83-4,700 mg/kg) in particular. The macroinvetebrate tissue samples showed measurable levels of arsenic, cadmium, copper, lead and zinc.

In 2001 a detailed Site Investigation was conducted by MCS Environmental, Inc. for the tailings removal area. This evaluation included characterization of the metal concentrations in the tailings, soils and surface and groundwater, determination of the volume and extent of tailings, charaterization of the wastes for preparation of a streamlined risk analysis,and an evaluation of the hydrologic conditions of the site. The results of the investigation identified that the tailings contain consistently elevated levels of arsenic (1059-4554 mg/kg), cadmium (3.93-5.8 mg/kg), copper (58.43-243 mg/kg), lead (372-1270 mg/kg) and zinc (528-691 mg/kg) (MCS, 2002a). Underlying soils were also sampled and showed similar metals levels. Goundwater sampling conducted through boreholes into the tailings and surface water sample results show metals exceeding drinking water standard for arsenic and iron and acute and chronic aquatic life standards for zinc.

b. Mechanism for Past, Present, or Future Release

The tailings are currently in an unconfined and erosive state as documented in the 2001 Site Investigation (MCS, 2002a); and the primary mechanism for the past and ongoing releases is the location of the waste within a drainage bottom with a perennial stream coursing through them. Releases will continue to occur, particularly during snowmelt and during storm events, until a stabilization or removal activity is conducted.

c. Events or Features that could Spread or Accelerate Releases

Large flood or significant precipitation induced runoff events could initiate further physcial failure of breached impoudment areas vulnerable to erosion mechanisms, or at minimum cause excessive rilling of exposed impoundment surfaces; leading to substantial contribution of sediments and metals to surface waters and the overall environment.

d. Properties that Influence the Rate of Releases

The tailings can be distinguished by size class as either fine-grained sand or silt sized particles. These materials are highly erosive, specifically in areas immediately adjacent to flowing surface waters on-site. Particle size may also facilitate airborne distribution of contaminated material especially during dry periods.

5. National Priority List (NPL Status)

The Warm Springs Tailings have not been proposed for the National Priorities List. The

adjacent White Pine, Newburg and B&G mines on private land have not been proposed for the National Priorities List or for listing under the State of Montana CECRA program.

6. Maps, Pictures, and Graphic Representation

A location map and site map are shown in Attachment 1. Photos of the Site are shown in the site map depiction. Graphic depictions are shown in the EE/CA (MCS, 2002b).

B. Other Action to Date

1. Previous Actions

No removal actions have been taken to date at the Warm Springs Tailings Site. MCS Environmental, Inc. under contract to the USDA Forest Service completed a site investigation and an EE/CA addressing the Warm Springs Tailings Site (MCS, 2002a&b). Subsequently, removal actions were scheduled for construction in 2003, however appropriated funding for the project was redirected to national fire fighting efforts due to the extreme fire season.

2. Current Actions

The Administrative Record for this project is available at the Helena Ranger District Office and may be viewed during regular business hours. Beth Ihle, of the Helena National Forest, Helena, Montana, was designated as the On-Scene Coordinator and spokesperson for this action pursuant to 40 CFR 300.415 (m).

Community involvement activities were conducted in 2002-3 for the project. These activities were re-initiated in late 2012 and have included contacts with adjacent landowners, publication of the proposed project in a legal notice in the Helena Independent Record (May 14, 2013), attendance at and dialogue with the Jefferson County Commission and their road maintenance staff, and presentations for area groups interested in Helena Forest Projects. In addition, coordination regarding the project has been conducted with Montana Department of Environmental Quality and Montana Fish Wildlife and Parks.

C. State and Local Authorities' Role

1. State and Local Actions to Date

The State of Montana through two State agencies conducted the initial investigations of the mines and tailings area as described above. The State ranked the Middle Fork Warm Springs site as priority #59 of 293 State wide sites. To date there has been no planned activities by the State on the private land. The Forest Service conducted field reviews of the removal area with MDEQ representatives in the fall 2012 (Pebbles Opp, Abandoned Mine Lands Program) and June 2013 (Robert Ray, TMDL Program). The Jefferson County Commission was provided a briefing of the removal action at their scheduled May 2013 commissioners meeting and ongoing dialogue is occuring with the county road foreman regarding road activities. Adjacent landowners were contacted via letter to inform them of the anticipated removal work and to provide for dialogue with them if it is requested.

2. Potential for Continued State/Local Response

Available resources to support and conduct response actions at the Site are not forseen by State of Montana authorities at this time. State and local authorities will be kept informed of all

activities of this Removal Action as it proceeds.

III. THREATS TO PUBLIC HEALTH OR WELFARE AND THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The President is authorized at 42 USC § 9604(a) to take action consistent with the National Contingency Plan (40 CFR 300) when there is a release, or a substantial threat of release of a hazardous substance into the environment, as in the case of the Warm Springs Tailings Site. Executive Order 12580 and 7 CFR 2.60(a)(39) delegates this authority to the USDA Forest Service, which delegation is recognized by the National Contingency Plan, when the source of the release or potential release of hazardous substances is on or from National Forest System lands.

The levels of surface contamination and the unconfined nature of the tailings which is resulting in ongoing releases support the decision to develop an EECA and perform a removal at the site. Conditions existing at the site meet the criteria for initiating a Removal Action under 40 CFR 300.415 (b)(2) of the National Contingency Plan (NCP).

A. Threats to Public Health or Welfare

MCS Environmental, Inc. conducted a baseline human health risk assessment utilizing data collected during their 2001 site investigation and knowledge of current land uses. The risk assesment was conducted using current guidance set forth by the State of Montana's Risk-Based Cleanup Guidelines for Abandoned Mine Sites and guidance established by EPA (MCS, 2002b). The recreational exposure hazard quotient (the likelyhood that of an adverse health effect is observed) for exposure to the tailings through ingestion or inhalation is 3.82 (values greater than 1 indicate that an adverse health effect may occur due to a chemical expossure). MCS concluded that present and future risks to humans exist mainly from the potential exposure through the incidental ingestion of soils, and sediments and dust inhalation. Arsenic and lead were considered to be the primary contaminants of concern. There is ongoing direct exposure by humans utilizing the site for recreational activities. There are also yearlong residents living less than one mile from the waste area.

Arsenic

There is potential for humans to come into direct contact with arsenic as it has high concentrations in the waste piles. Arsenic is a naturally occuring element that can be absorbed from the gastrointestinal tract and distributed rapidly to body tissues with greatest concern being the liver. It is a Class A known human carcinogen. Acute toxic signs of arsenic exposure include vomiting and diarrhea due to severe gastrointestinal damage. Lethal dosages range from 60 to 250 mg arsenic. The most significant effect of chronic exposure through ingestion is carcinogenicity. Skin and respiratory tract tumors are found in people exposed to arsenic fumes and dusts and skin cancers are found in people exposed to arsenic through ingestion. Other cancers tied to arsenic are also shown in studies.

Lead

There is potential for humans to come into direct contact with lead in the waste materials at the removal area. Lead is classified as a B2 carcinogen by EPA and lead compounds are known to cause acute health effects. Lead can enter the body via ingestion and inhalation. Children appear to be the segment of the population at greatest risk from toxic effects of lead. Initially lead travels in the blood to the soft tissues and then gradually redistributes to the bones and teeth

where it tends to remain. Children exposed to high levels of lead have exhibited nerve damage, permanent mental retardation, colic, anemia brain damage and death.

B. Threats to the Environment

The threats of the wastes and water in the tailings area have been previously described and include: the ongoing off site migration of the tailings, the known exceedences of water quality standards at the site, and the elevated levels of metals measured in macroinvertebrates, as documented in sample analyses conducted by the US Geological Survey (Klein et al., 2001; Cleasby et al., 2003).

A qualitative ecological risk assessment was conducted by comparing concentrations of contaminants of concern with established risk based guidelines (MCS, 2002b). The exposure assessment identified aquatic organisms and those species that rely on them for their food source, native terrestrial plant communities growing in proximity to the project area, and terrestrial animals as the receptors of concern.

Ecological impact quotients for aquatic life exceeded 1.0 (values greater than 1 indicating that an adverse ecological impact may occur due to a chemical expossure) primarily due to zinc concentrations in the surface waters utilizing chronic aquatic life standards. Ecological impact quotients for phytotoxicity also greatly exceeded 1.0 indicating the potential for significant adverse ecological effects to plant communities with arsenic presenting the most phytotoxic risk. The Ecological Impact Quotient for deer, a typical mammal user of the site, also exceeded 1.0 based on the potential for ingestion of tailings as a result of browsing in the area and licking mineral salts in the tailings.

Zinc concentrations in the wastes and water are a primary reason that the ecological impact quotients exceed 1.0 for the water and soil media. The effects of zinc on the environment is described specifically below.

Zinc

In acid environments, zinc is relatively soluble and mobile as a result of weathering. Zinc is commonly found in the upper soil horizons and soluble forms of zinc are easily taken up by plants. Zinc produces acute toxicity in freshwater organisms over a range of concentrations below those found in the project area. In many types of aquatic plans and animals, growth, survival and reproduction can all be adversely affected by elevated zinc levels.

IV. ENDANGERED DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the Removal Action identified in this Action Memorandum, may present an imminent and substantial endangerment to human health and the environment.

V. PROPOSED ACTION AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The recommended actions include removing the tailings wastes from the floodplain and adjacent areas of the Middle Fork of Warm Springs Creek, and consolidating them into an engineered repository located onsite (*Attachment 1*). The repository has been designed to prevent migration of hazardous substances from the mine wastes. The removal action is expected to provide long-term protection and improve environmental conditions at the site.

The major components of the removal action are listed below and may include other actions consistent with the scope of this removal.

a. Temporarily diverting or otherwise protecting surface waters in the waste removal area during construction activities.

b. Removing and protecting heritage features for replacement on site following reclamation.

c. Clearing and grubbing access roads, repository area and waste removal area. Materials to be used as part of final reclamation will be stored onsite for later use.

d. Constructing temporary access roads to waste removal area and repository site that can support heavy truck traffic. These roads will be decommissioned after project completion.

e. Installing access controls to prevent public entry to the construction area.

f. Installing stormwater protections.

g. Constructing an engineered repository so as to permanently store removal area wastes. The repository will include design features to prevent resaturation of placed wastes from below as well as a composite earthen and geosynthetic final cover to prevent infiltration of precipitation into the wastes. Wastes will be prepared to ensure appropriate compaction and moisture during placement in the repository.

h. Removing tailings and contaminated subsurface soils from the four nested impoundments that are negatively impacting the Middle Fork of Warm Springs Creek and placing them in the prepared repository.

i. Regrade tailings removal area, place clean fill and growth media in waste removal area and reconstruct stream channel and valley bottom area. Place slash and other reclamation materials for stability and microsites.

j. Apply native seed and sterile annual seed, install stormwater controls, rehabilitate temporary access roads.

k. Install monitoring well at repository site.

l. Install temporary and final institutional controls for managing public access to reclaimed area.

a. <u>Justification for Preferred Alternative</u>

The primary reasons for selecting the removal to an on-site repository alternative, Alternative 2, are as follows:

- The risk to human health posed by metals in the tailings at the Site would be effectively reduced or eliminated under this alternative, specifically in the floodplain areas frequented by recreationists and dispersed camping use.
- Removal of the tailings would decrease metals availability to surface waters and sedimentation from the impoundments to the stream system which occur during precipitation and seasonal surface runoff events, improving the aquatic conditions in Middle Fork Warm Springs Creek.
- Removal of the tailings would effectively reduce the threat to the environment posed by the potential for large scale physical failure of the impoundments and subsequent dispersal of contamination, that could be induced by a significant flood event.
- The selection of an on-site repository is cost effective and practical in consideration of the costs and impacts associated with hauling wastes to the nearest off-site repository.

b. Technical Feasibility and Probable Effectiveness

The selected alternative, Alternative 2, is both technically and adminsitratively feasible. Construction of an appropriate waste repository including impermeable cap and installation of associated basal drain systems are considered common construction practices. Materials and methods applicable to this type of construction and material handling are readily available. Site characteristics allow for the project to be completed in two phases. Removal of the mill tailings to an on-site constructed waste repository will effectively reduce or eliminate the human health risk posed by the contaminants of concern in the tailings, and reduce the threat to the environment.

c. Further Information

No further information is needed to select the proposed action.

d. Verify Success of Contamination Containment

Adherance to the construction plans aided by visual observations of tailings extent, and select sampling will be used to determine final excavation limits. Native material underlying tailings will be over-excavated by a minimum of six inches to remove any native materials contaminated by leaching of metals. Material samples will be collected from the base of excavations and tested for acceptable concentrations of contaminants.

e. Sensitive Environments

Impacts to surface resources will be minimized through project design features, use of Best Management Practices (BMPs), and construction oversight by the Forest Service (OSC, COR, Inspectors). Interim site controls and adherence to the Stormwater Management Plan will be used between Removal Action phases to protect removal areas from erosion and prevent mobilization of tailings awaiting removal in Phase II. All road segments constructed in support of this Removal Action will be considered temporary, be specified in location, and exist at the level required to facilitate safe and appropriate equipment travel. Utilization of native species will be required in revegetation of tailings removal areas.

f. Uncertainties

No uncertainties exist that would significantly effect the implementation of the Removal Action.

g. Institutional Controls

Future mining and/or mining-related activities will be subject to Forest Service regulations at 36 CFR 228 subpart b, which include requirements for site reclamation and mitigation of environmental impacts.

h. Off-Site Disposal

Contaminated materials will be removed to an on-site engineered waste repository, therefore off-site disposal is not required.

i. Post-Removal Site Controls

Post-removal Site controls include barriers to public access, and implementation of a site monitoring plan. Barriers may include fencing or other similar method for prohibiting public access. The site monitoring plan will include performance objectives for stability and function of the remedy as well as sample collection for tracking changes to water quality. A monitoring well will be installed downslope of the toe of the repository to facilitate groundwater monitoring post-construction.

j. Changes Resulting from Public Comments

Implementation of the selected alternative was scheduled for construction in 2003. The public, at that time, was informed of the Removal Action and selected alternative through a news release and public meeting held September 10, 2002, in Clancy, Montana. An offical 30-day public comment period was provided to invite comment on the EE/CA and the preferred alterative. No negative comments were received as documented, by then OSC, Kurt Cuneo.

A legal notice was published May 14, 2013, in the Helena Independent Record newspaper informing the public of the renewed Removal Action efforts, and availability of the administrative record for public review and comment. A fact sheet describing the Warm Springs Tailings Site and the Removal Action was sent to all landowners of private properties located in the immediate Middle Fork of Warm Springs Creek vicinity.

Briefings summarizing the Removal Action have been provided to the Jefferson County Commissioners, the Elkhorn Working Group, and at the June 2013 Hometown Helena presentation series. To date, comments received from these entities and the general public have been supportive of the selected alternative and overall Removal Action.

2. Short-term Impacts

Consideration of potential short-term impacts to the public were considered in alternative review and selection of the preferred alternative, Alternative 2. Traffic flow and the potential for dust generation will increase during the mobilization and demobilization of equipment and supplies. Temporary road closures or traffic delays may be required on FS road 4016 during removal activities; coordination to allow for private landowner access will be included in the project travel plan.

3. Contribution to Remedial Performance

The project area is not part of a State or Federal NPL site and there are additional inventoried mine sites with off site impacts located upstream of the project area. This Non-Time- Critical Removal Action addresses the need to reduce or eliminate the risks to human health and reduce the threat to the environment from the immediate project area. Source removal will mitigate the exposure risk to humans due to inhalation or ingestion of tailings material containing arsenic, lead and zinc, the primary contaminants at concentrations of concern. Removal of the metal-laden tailings material will reduce the overall sediment and metals loading constributions to the local surface water and groundwater.

4. Description of Alternative Technologies

a. Institutional Controls

Institutional controls include land use and access restrictions. Institutional controls alone would not prevent contaminant migration off-site via wind dispersion, or surface water or groundwater pathways. Therefore, institutional controls as a separate alternative were not considered. Institutional controls were however incorporated as components of other alternatives identified in the EE/CA (MCS, 2002b).

b. Engineering Controls

Engineering controls limit the release, or threat of release, of hazardous substances generally by limiting mobility through isolation, and/or by limiting physical processes necessary for mobility. These measures include surface controls, in-situ containment, removal to an on-site engineered repository, or removal to an off-site regional mine waste repository. These measures were incorporated into the alternatives considered for this site.

c. Waste Disposal

Waste disposal is used as a source control measure by placing contaminated media in an engineered, controlled environment. Waste control measures evaluated for the Site included: in-situ amendment and application of soil covering, total removal to an engineered on-site waste repository, and total removal of wastes to the Luttrell Pit regional mine waste repository. Total removal to an on-site repository was selected as it is responsive to the waste issues at the site and more cost effective than off site disposal to the Luttrell Pit.

d. Miscellaneous Alternatives

Various treatments were investigated but rejected due to a variety of reasons including uncertainties in effectiveness, and costs. These alternatives include: fixation and stabilization methods to effectively immobilize metals; and physical and chemical treatment methods to separate contaminants from wastes.

5. Engineering Evaluation / Cost Analysis (EE/CA)

An EE/CA was prepared for the Warm Springs Tailings Site by MCS Environmental, Inc. of Missoula, MT (2002b). The EE/CA detailed site characteristics and identified and developed response alternatives. The USDA Forest Service analyzed the effects of the alternatives identified in the EE/CA, and considered public comment. The Forest Service then selected a preferred alternative. A copy of the EE/CA is available for review in the Administrative Record

located at the Helena Ranger District.

6. Applicable or Relevant and Appropriate Requirements (ARARs)

This Removal Action shall, to the extent practicable, attain all Applicable or Relevant and Appropriate Requirements (ARARs) under federal or State of Montana laws or facility siting laws. Applicable requirements address a specific hazardous substance, pollutant or contaminant found at a site. Relevant and Appropriate requirements address situations or problems similarly encountered at another site.

Potential federal and state ARARs for this project were initially developed by MCS Environmental (2002), as listed in Appendix B of the Warm Springs Drainage Mine and Tailings Reclamation Project EE/CA. The ARARS have been updated and are attached as Attachment 2.

7. Project Schedule

Work will be conducted in two phases (field seasons); on-site activities are anticipated to begin fall of 2013 and be completed in 2014.

8. References

Cleasby, T., Thamke, J. and Nimick, D., 2003, *Arsenic and Metal Loads and Source Areas in the Middle Fork Warm Springs Creek Watershed, Jefferson County, Montana, June 2001*. U.S. Geological Survey, Water-Resources Investigation Report 03-4153, 33 p.

Ihle, Bethany., 2013, *The White Pine and Vicinity, Potentially Responsible Party Search – February 2013 Addendum*, prepared for the Helena National Forest, 9 p.

Klein, T., Thamke, J. and Farag, A., 2001, *Water-Quality, Biology, and Streambed Sediment Data and Preliminary Geochemical Interpretations for Streams in the Upper Prickly Pear Creek Watershed, Montana, 2000*, U.S. Geological Survey, Open-File Report 01-280, 46 p.

MCS Environmental, Inc., 2002a, *Draft Site Investigation Report for the Warm Springs Drainage, Mine and Tailings Reclamation Project, Helena National Forest*, prepared for USDA Forest Service - Region 1, 35 p. and four appendices.

MCS Environmental, Inc., 2002b, *Revised Draft Engineering Evaluation and Cost Analysis for Warm Springs Drainage, Mine and Tailings Reclamation Project, Helena National Forest, Warm Springs - Alhambra District, Jefferson County, Montana*, prepared for USDA Forest Service - Region 1, 107 p.

Metesh, J., Lonn, J., Marvin, R., Hargrave, P., and Madison, J., 1998, *Abandoned-Inactive Mines, Helena National Forest, Volume I – Upper Missouri River Drainage*, Montana Bureau of Mines and Geology, Open-File Report/MBMG 352, p. 104 - 114.

Milodragovich, Elizabeth, 2001, *The White Pine and Vicinity, Potentially Responsible Party Search*, prepared for the Helena National Forest, 20 p.

Montana Department of State Lands, 1995, *Abandoned Hardrock Mine Priority Sites 1995 Summary Report*, MDSL Abandoned Mine Reclamation Bureau, page 5-91.

Olympus Environmental Science and Engineering, Inc., 1998, *Surface Water Quality Investigation of the Middle Fork Warm Springs Site*, prepared for MDEQ – Mine Waste Cleanup Bureau, 35 p.

B. Estimated Costs

On-site activities under the preferred alternative, Alternative 2, will be conducted in two phases and are funding dependent. The engineer's estimate for the cost of performing the on-site work for each phase is estimated as follows:

Phase I $985,000

Primary activities include: site preparation, repository construction, removal of Tailings Areas 3 and 4 and underlying soils and placement into repository, partial stream reclamation, obliteration of temporary roads, and installation of interim storm water controls and site controls.

Phase II $230,000

Primary activities include: removal of remaining tailings (Tailings Areas 1 and 2), conducting remaining stream reclamation, capping and closing the repository, revegetation, installation of monitoring well and installation of site controls.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If no action is taken to remove the contaminated mill wastes from the Warm Springs Tailings Site, the physically unconfined and highly erodible tailings would continue to contribute to the impairment of in-drainage environmental conditions. The Site would remain physically vulnerable to large scale flood events; leaving potential for further degradation of the already breached impoundments and entrainment of large volumes of tailings located immediately adjacent to the creek, re-distributing the waste material further downstream beyond the existing Site. The Site would continue to attract dispersed campsite use and motorcycle/ATV traffic, posing a threat to recreationists via direct contact with the arsenic and lead contaminated tailings.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

The Forest Service conducted a Potentially Responsible Parties (PRP) investigation for the Warm Springs Tailings Site (Milodragovich, 2001) and prepared an addendum update in 2013 (Ihle, 2013). In review of the 2001 report and 2013 addendum, Office of General Council (OGC) attorney, Mike Hope, identified one potentially viable PRP that may warrant enforcement at the Site.

A large mineral/oil and gas exploration company acquired unpatented mining claims in the area of concern in 1980, and held those claims for a period of one year. There is no evident indication of exploration activities being implemented during that year. The exploration company was subject to a merger with a larger company in the late 1970's. The Forest Service

sent a 104(e) letter to the larger company, February 2013. The company responded in June 2013 that they had no documents or information responsive to the 104(e) request and referenced a former parent corporation that might have information. The Forest Service has received authorization from the Environmental Management Division of the U. S. Department of Agriculture to use appropriated funds for the removal action consistent with the National Contingency Plan.

The Forest Service actions at the Site will be consistent with the NCP, therefore the Forest Service may pursue cost recovery against any party should they be determined at a later date to be a viable PRP.

IX. RECOMMENDATION

This decision document represents the selected Removal Action for the removal and disposal of milling waste on NFS lands located within the Middle Fork of Warm Springs creek. The project is located in Jefferson County on the Helena Ranger District of the Helena National Forest. This document was developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the site. Conditions at the site meet the NCP section 300.415 (b)(2) criteria for a removal and I recommend your approval of the proposed removal action.

_____ _____

BETHANY A. IHLE Date
On-Scene Coordinator (OSC)
Helena and Lewis and Clark National Forests

I concur with the recommendation to implement the proposed alternative as described in this Action Memorandum and evaluated in the Engineering Evaluation and Cost Analysis for the Warm Springs Tailings Site.

_____ _____

HEATHER DEGEEST Date
Acting District Ranger
Helena Ranger District

I concur with the recommendation to implement the proposed alternative as described in this Action Memorandum and evaluated in the Engineering Evaluation and Cost Analysis for the Warm Springs Tailings Site.

_____ _____

WILLIAM AVEY Date
Forest Supervisor
Helena & Lewis and Clark National Forests

I concur with the recommendation to implement the proposed alternative as described in this Action Memorandum and evaluated in the Engineering Evaluation and Cost Analysis for the Warm Springs Tailings Site.

_____ _____

BOB KIRKPATRICK Date
CERCLA Coordinator
Northern Region

I concur with the recommendation to implement the proposed alternative as described in this

Action Memorandum and evaluated in the Engineering Evaluation and Cost Analysis for the Warm Springs Tailings Site.

_____ _____

FAYE L. KRUEGER Date
Regional Forester
Northern Region

cc: Regional Office – Bob Wintergerst, Nancy Rusho
OGC – Mike Hope
Montana Dept. of Environmental Quality – John Koerth

Attachments:

1- Location/Site Map
2- ARARS Table